

CLAIMS

I/We claim:

- [c1] 1. A method for handling an unmanned aircraft, comprising:
releasably capturing an aircraft by contacting a lifting surface of the aircraft
with a flexible recovery line;
while a first portion of the aircraft is releasably coupled to the flexible
recovery line, securing a second portion of the aircraft; and
while the second portion of the aircraft is secured, releasing the first portion
of the aircraft from the flexible recovery line.
- [c2] 2. The method of claim 1 wherein the aircraft includes a capture device
mounted to the lifting surface, and wherein releasably capturing the aircraft
includes releasably securing a portion of the recovery line to the capture device.
- [c3] 3. The method of claim 1 wherein the aircraft includes a first lifting
surface portion and a second lifting surface portion, wherein releasably capturing
the aircraft includes capturing the first lifting surface portion, and wherein securing
a second portion of the aircraft includes securing the second lifting surface.
- [c4] 4. The method of claim 1, further comprising applying tension to the
flexible recovery line before releasably capturing the aircraft.
- [c5] 5. The method of claim 1 wherein the flexible recovery line depends
from an extendable boom, and wherein the method further comprises moving the
boom while the first portion of the aircraft is releasably coupled to the flexible
recovery line to position the aircraft relative to a support platform.
- [c6] 6. The method of claim 1 wherein the flexible recovery line depends
from a support, and wherein the method further comprises retracting the flexible

recovery line to draw the aircraft into contact with the support before securing the second portion of the aircraft.

[c7] 7. The method of claim 1 wherein securing the second portion of the aircraft includes securing the second portion of the aircraft to a fixed securement member.

[c8] 8. The method of claim 1 wherein securing the second portion of the aircraft includes securing the second portion of the aircraft to a securement member fixedly attached to a support platform.

[c9] 9. The method of claim 1, further comprising releasably securing at least a portion of the aircraft to a storage apparatus before releasing the first portion of the aircraft from the flexible recovery line.

[c10] 10. The method of claim 1, further comprising releasably securing a portion of the aircraft to a storage apparatus by moving the storage apparatus pivotally up to contact a fuselage of the aircraft before releasing the first portion of the aircraft from the flexible recovery line.

[c11] 11. A method for handling an unmanned aircraft, comprising:
 deploying a flexible recovery line from an extendable boom mounted at
 least proximate to a support platform, the flexible recovery line being
 positioned to capture an unmanned aircraft in flight;
 flying the aircraft to contact a first lifting surface portion of the aircraft with
 the flexible recovery line while the aircraft is in flight;
 releasably capturing the aircraft in flight with the flexible recovery line;
 while the aircraft is releasably coupled to the flexible recovery line, moving
 the boom to position the aircraft relative to the support platform;
 releasably securing a second lifting surface portion of the aircraft to a
 securement member positioned at the support platform;

moving a storage apparatus pivotally up from the support platform to contact a portion of a fuselage of the aircraft; and releasing the aircraft from the flexible recovery line and the securement member.

[c12] 12. The method of claim 11, further comprising drawing the aircraft upwardly into contact with the boom while the aircraft is releasably coupled to the flexible recovery line.

[c13] 13. The method of claim 11 wherein the aircraft includes a capture device mounted to the first lifting surface portion, and wherein releasably capturing the aircraft in flight includes releasably securing a portion of the flexible recovery line to the capture device.

[c14] 14. The method of claim 11 wherein moving the boom includes retracting at least a portion of the boom after releasably capturing the aircraft and before releasably securing the second lifting surface portion of the aircraft to the securement member.

[c15] 15. The method of claim 11 wherein moving the boom includes retracting the boom along a longitudinal axis and rotating the boom about a rotational axis transverse to the longitudinal axis.

[c16] 16. The method of claim 11 wherein releasably securing a second lifting surface portion of the aircraft includes securing the aircraft to a support platform on a ship deck.

[c17] 17. An apparatus for handling unmanned aircraft, comprising:
support means;

recovery means carried by the support means, the recovery means being positioned to intercept a lifting surface of an unmanned aircraft in flight and attach to a first portion of the aircraft; and
securement means at least proximate to the support means, the securement means being positioned to releasably and securely attach to a second portion of the aircraft.

[c18] 18. The apparatus of claim 17 wherein the support means includes an extendable boom having at least one retractable portion.

[c19] 19. The apparatus of claim 17 wherein the recovery means includes a flexible recovery line suspendable in a generally downward direction from the support means.

[c20] 20. The apparatus of claim 17 wherein the securement means includes a securement member positioned at a station for retrieval of the aircraft.

[c21] 21. The apparatus of claim 17, further comprising the aircraft, and wherein the aircraft includes a cleat attached to the lifting surface, and wherein the recovery means are positioned to attach to the cleat.

[c22] 22. An apparatus for handling unmanned aircraft, comprising:
a support structure;
a flexible recovery line carried by the support structure and positioned to capture an unmanned aircraft in flight by contacting a spanwise lifting surface at a first portion of the aircraft; and
a securement member positioned at least proximate to the support structure, the securement member being configured to releasably and securely attach to a second portion of the aircraft.

- [c23] 23. The apparatus of claim 22, further comprising a support platform, and wherein the support structure is carried by the support platform.
- [c24] 24. The apparatus of claim 22, further comprising a support platform, and wherein the support structure includes an extendable boom pivotally mounted to a rotatable base positioned on the support platform.
- [c25] 25. The apparatus of claim 22 wherein the support structure includes an extendable boom having at least one section that is movable along a longitudinal axis from a retracted position to an extended position.
- [c26] 26. The apparatus of claim 22, further comprising the aircraft, wherein the aircraft includes a first lifting surface portion having a first capture device and a second lifting surface portion having a second capture device, and wherein the first capture device is configured to be releasably secured to the flexible recovery line and the second capture device is configured to be releasably secured to the securement member.
- [c27] 27. The apparatus of claim 22, further comprising a storage apparatus positioned at least proximate to the support structure, and wherein the storage apparatus is pivotable relative to the support structure between a first position and a second position, the storage apparatus being oriented to contact and releasably receive the aircraft when in the second position.
- [c28] 28. An apparatus for handling unmanned aircraft, comprising:
 an extendable boom having a first section and a second section, at least one of the first and second sections being movable relative to the other between a retracted position and an extended position;
 a flexible recovery line carried by the extendable boom and positioned to capture an unmanned aircraft in flight by contacting a first lifting surface portion of the aircraft;

a securement member positioned at a least proximate to the extendable boom to releasably secure a second lifting surface portion of the aircraft while the aircraft is releasably secured to the flexible recovery line; and

a storage apparatus positioned at least proximate to the extendable boom, the storage apparatus being pivotable between a first position and a second position, the storage apparatus in the second position being oriented to contact and releasably attach to a fuselage of the aircraft before the aircraft is released from the flexible recovery line.

[c29] 29. The apparatus of claim 28, further comprising a support platform, and wherein the support structure is carried by the support platform.

[c30] 30. The apparatus of claim 28, further comprising a support platform, and wherein the extendable boom is pivotally mounted to a rotatable base carried by the support platform.

[c31] 31. The apparatus of claim 28, further comprising the aircraft, wherein the aircraft includes a first capture device at the first lifting surface portion, the first capture device being configured to be releasably secured to the flexible recovery line, and wherein the aircraft further includes a second capture device at the second lifting surface portion, the second capture device being configured to be releasably secured to the securement member.

[c32] 32. The apparatus of claim 28, further comprising the aircraft, wherein the aircraft includes a first capture device at the first lifting surface portion, the first capture device being configured to be releasably secured to the either the flexible recovery line or the securement member, and wherein the aircraft further includes a second capture device at the second lifting surface portion, the second capture device being configured to be releasably secured to either the flexible recovery line or the securement member.